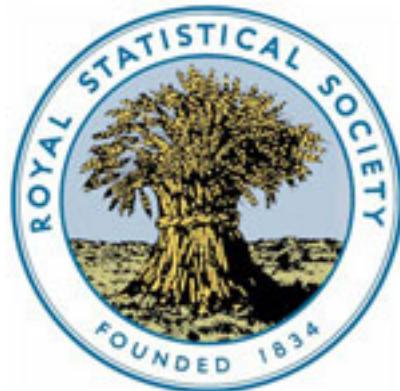


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PROFESSOR K. D. TOCHER, 1921-1981

Professor KEITH TOCHER, or Toch, as he was better known, died suddenly on December 30th, 1981, at the age of 60. At the time of his death he was Professor of Operational Research at the University of Southampton, but before that had a long, varied and immensely important career which will leave a permanent mark on Operational Research and Statistics.

Toch took a first class honours degree in mathematics at University College London in 1941. His war service was in the Ministry of Aircraft Production where he worked on the problems of airborne torpedoes. A feature of mathematical and statistical life, at that time, was the existence throughout the war machine of groups of highly distinguished mathematicians, physicists, engineers and biologists. When the war ended Tocher moved to one of these groups of mathematicians at the National Physical Laboratory.

At that time, before academic life had returned to normal, the rules of the University of London prescribed that both external and internal students for the BSc Statistics, should take the same papers. Toch had registered as an external student and decided to take the degree in the Summer of 1946. Because Toch was the only candidate, and the papers had to be set most hurriedly, his set remain the most difficult ever for that examination. Needless to say, he obtained a brilliant first class.

He followed this up by private study and research into the design of experiments and published his brilliant papers on the use of randomisation to obtain "similarity" in tests for 2×2 tables. It is said that his contributions to discussion in the Research Section of the Royal Statistical Society are still worth reading, nearly 40 years later. During this time he worked part time for his PhD degree at London University, obtaining it in 1949, when he moved to Imperial College.

The tradition of Imperial College was that of applicable and numerical mathematics, and most mathematicians at that time regarded it as bizarre that their equipment would ever need to be any more than a hand-calculating machine. Toch's way round the funding problem was typically ingenious. He spent such money as he could get, not directly on computing equipment but on tools from which he and his colleagues could make themselves their own computers. It was he who first had the idea of modular construction of these machines which is now a universal practice. Over that tremendously productive period he and Sidney Michaelson were to be found cutting up aluminium sheets or unwinding the 4-feet diameter reels of cardboard tape from which Hollerith cards were cut while developing their own theory of computer design. They both haunted the Charing Cross Road and Edgware Road buying up cheap war-surplus parts to build the machine. A report on their work would be a rewarding experience for anyone interested in the history of the development of computing because it reveals ideas, not necessarily practical given the technology available to them, which were to be realised in later systems. It is a curious irony that one of the earliest pioneer machines in the UK and closest to the Science Museum is not represented in the recently formed History of Computing Department.

In 1957 the further development of computers at Imperial College ran into a roadblock. It was thought by the College that the successful development of the Tocher/Michaelson machine would inhibit and prevent the acquisition by Imperial College of the new Ferranti Mercury (it is of interest to note that this exciting and large machine in fact has less than the storage capacity of a present day PET). Tocher and Michaelson found their funds almost completely cut off as the College wished to concentrate its efforts on obtaining a new Mercury.

From the point of view of Operational Research, this was extremely fortunate though it must have appeared at that time to Toch as a disastrous blow. For it was then that Stafford Beer was creating the Department of Operational Research and Cybernetics at Sheffield and to the surprise of all his colleagues Toch, who was such a confirmed Londoner that he must have wanted to boil his drinking water when away from the sound of Bow Bells, moved to Sheffield and became seized of the importance of the use of computers in production scheduling and planning. The computer at United Steel Company, as it then was, was a Pegasus. With enthusiasm, imagination and zeal, Toch spearheaded the development of a group of concepts in terms of which useful models of the real world could be described. Any valuation of Toch's contribution of the development of simulation methods, which is the area on which he concentrated at Sheffield, would need the efforts of many people to do justice to his work and such an assessment certainly lies beyond the competence of the author of this memoir. He was always seen as the creator of the most fundamental aspects of the way in which simulation programmes are organized. He was an innovator and inventor and his invention was not confined to simulation as such.

During the 1950s and 1960s, which was perhaps the most exciting period in OR, Toch's research publications continued to pour forth. This was recognized by the award of his Doctor of Science degree

from London University in 1957. But right up to the time of his death he was active in research and was a tremendously stimulating research supervisor. There was always a queue of students waiting to be allowed to work with him. He was revered by them for his experience and knowledge and had their affection for his constant availability.

Toch's activities, however, were not confined to the development of simulation with which his name will always be associated. Over a period of 30 years he served on and was a member of 24 societies and major committees including the Mathematical Sciences Sub-Committee of the UGC, the SERC OR Panel and the Home Office Scientific Advisory Committee for the Police.

His final move was to a full-time Chair in Operational Research at the University of Southampton. For many years the first name that came to mind for any vacant Chair was that of Toch and eventually he succumbed. His period at Southampton was tragically short. Toch had always been an amused observer of administrative eccentricity, and it was a delight to see the way in which he threw himself into the problems of Southampton University with a youthful zest and real sensitivity. At what was to be his final Senate, he made a contribution to the problem of the cuts which was Olympian in its scope, magisterial in its authority and humane in its sensitivity. His tragic sudden death cut short what would have been his finest hour.

Besides all these activities of an academic and research nature he played a full part in the professional life of our country. He served on the Council of the Royal Statistical Society and was a founder member and member of the Council of the British Computer Society. The BSC elected him an Honorary Fellow in recognition of his distinguished service. His years of contribution to Operational Research were recognized by the award of the silver medal of the Operational Research Society and his election to the Presidency. At meetings of scientific and learned societies his contribution to discussion and the reading of his papers was outstanding. The first thing anyone did on receiving the programme of a conference at which one was on the programme was to make a careful check that one's session did not clash with one of Toch's because of his effect on one's own audience. He was stimulating, if sometimes annoying and aggravating in discussion. Of transparent honesty, it was a wonderful experience to fight him in argument. His arguments were always carried out according to the Queensberry Rules, with courtesy, rapier wit and gaiety. As a giant of a man, he could be infuriating. Most of his friends from time to time had to resist an impulse to hit Toch on the head with a blunt instrument. But such an assault would have been carried out with love and affection.

To his students, colleagues and friends, he was overwhelming in his response to requests for help. His intellect, his breath of understanding, his hatred of cant and hypocrisy, his generosity and his wit will long remain in our hearts. In every way he was a big man. Physically, mentally, morally in his humanity, he inspired affection, even love from all those who knew him. Operational Research has been greatly affected by this great man. His influence on us all will remain and will be transmitted by his friends and colleagues to those who never met him. Toch is survived by his close knit family, his wife Charlotte, his son David and his daughter Judith. To all of them our sympathy and affection is extended. If the loss felt by those of us in OR is so great, it must be infinitely more unbearable to his beloved family.

B. H. P. RIVETT

Acknowledgements

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JOSEPH OSCAR IRWIN, 1898-1982

JOSEPH OSCAR IRWIN, a Past-President of the Royal Statistical Society, died on July 27th, 1982, in Schaffhausen, Switzerland, at the age of 83. He was born in London on December 17th, 1898, and attended the City of London School, which he went through on the classical side. At a late stage he decided to take up mathematics, and was awarded a scholarship at Christ's College, Cambridge in December 1917. His last year at school was seriously interrupted by illness, which recurred some 10 years later. Being physically disqualified for army service, he obtained a temporary post (between school and